AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An external force control method for controlling an external force applied to an animal through an orthosis attached to the animal that makes a movement along with the activities of muscle fibers, the method comprising:

a myoelectric potential measurement step of measuring a myoelectric potential x that occurs in the body of the animal;

an external force setting step of setting a value of an external force f applied to the animal through the orthosis according to an external force ~~function f(x) with~~function f(x) with the myoelectric potential x as a variable on the basis of the measured value of the myoelectric potential x;

a motion variable measurement step of measuring a motion variable y varying with the motion of the animal under the condition of the external force applied through the orthosis;

a factor setting step of setting a value of a factor γ according to a factor function $\gamma(f, y)$ with the external force f and the motion variable y as variables on the basis of the set value of the external force f and the measured value of the motion variable y;

a determination step of determining whether a deviation δ between the set value of the factor γ and target value γ_t thereof is less than a reference value ε; and

an external force function setting step of setting a new external force function

f(x) in such a way that the set value of the factor γ approaches the target value γ_t if the deviation δ is determined to be equal to or greater than the reference value ε in the determination step.

2. (Original) The external force control method according to claim 1, wherein the external force function setting step comprises setting a value of a coefficient α that represents the relation between the myoelectric potential x and the external force f and setting the external force function f(x) according to a basic function F(x, α) with the myoelectric potential x and the coefficient α as variables on the basis of the set value of the coefficient α.

3. (Original) The external force control method according to claim 1, wherein the external force function setting step comprises finding the external force target value f_t according to the factor function $\gamma(f, y)$ on the basis of the measured value of the motion variable y and the target value γ_t of the factor γ and setting the external force function f(x) in such a way that the external force f approaches the external force target value f_t.

4. (Original) The external force control method according to claim 3, wherein the external force function setting step comprises setting the external force function f(x) in such a way that the maximum measured value of the external force f approaches the maximum value of the external force target value f_t.

5. (Original) The external force control method according to claim 1, wherein the determination step is omitted and the external force function setting step is performed after the first external force setting step.

6. (Original) The external force control method according to claim 1,

wherein:

the motion variable measurement step comprises measuring the resultant force of an internal force and an external force of the animal as the motion variable y; and

the factor setting step comprises setting the ratio of the external force f to the resultant force of the internal force and the external force of the animal as the factor γ ($0 \leq \gamma < 1$).

7. (Original) The external force control method according to claim 1, wherein the motion variable measurement step comprises measuring a primitive motion variable varying with the motion of the animal and measuring the motion variable according to an inverse dynamics model that represents the behaviors of the animal on the basis of the measured value of the primitive motion variable.

8. (Original) The external force control method according to claim 1, further comprising a motion state determination step of determining the motion state of the animal according to a given correspondence between the primitive motion variable and the motion state of the animal on the basis of the measured value of the primitive motion variable after measuring the primitive motion variable varying with the motion of the animal, wherein the motion variable measurement step comprises measuring the motion variable y according to a given correspondence between the motion state of the animal and the motion variable on the basis of the motion state determined in the motion state determination step.

9. (Original) The external force control method according to claim 1, further comprising a step of measuring the external force f, wherein the factor setting step comprises setting a value of the factor γ according to the factor function $\gamma(f, y)$ with the external force f and the motion variable y as variables on the basis of the

measured value of the external force f, instead of the set value of the external force f, and the measured value of the motion variable y.

10. (Original) The external force control method according to claim 1, further comprising a motion state determination step of determining the motion state of the animal according to a given correspondence between the primitive motion variable and the motion state of the animal on the basis of the measured value of the primitive motion variable after measuring the primitive motion variable varying with the motion of the animal, wherein the external force function setting step comprises setting a new external force function f(x) responsive to each motion state determined in the motion state determination step.

11. (Original) The external force control method according to claim 10, wherein:

the determination step comprises determining whether the deviation δ is less than the reference value ε on the basis of the factor target value γ_t set for each motion state according to the motion state determined in the motion state determination step; and

the external force function setting step comprises setting a new external force function f(x) on the basis of the factor target value γ_t set for each motion state according to the motion state determined in the motion state determination step.

12. (Original) The external force control method according to claim 1, wherein the determination step comprises determining whether the deviation δ is less than a threshold ε according to the threshold ε depending on whether the deviation δ is positive or negative.

13. (Currently Amended) An external force control system for controlling an

external force applied to an animal through an orthosis attached to the animal that makes a movement along with the activities of muscle fibers, the system comprising:

myoelectric potential measurement means for measuring a myoelectric potential x that occurs in the body of the animal;

external force setting means for setting a value of an external force f applied to the animal through the orthosis according to an external force ~~function f(x) with~~function f(x) with the myoelectric potential x as a variable on the basis of the measured value of the myoelectric potential x measured by the myoelectric potential measurement means;

motion variable measurement means for measuring a motion variable y varying with the motion of the animal under the condition of the external force applied through the orthosis;

factor setting means for setting a value of a factor γ according to a factor function $\gamma(f, y)$ with the external force f and the motion variable y as variables on the basis of the set value of the external force f set by the external force setting means and the measured value of the motion variable y measured by the motion variable measurement means;

determination means for determining whether a deviation δ between the set value of the factor γ set by the factor setting means and target value γ_t thereof is less than a reference value ε; and

external force function setting means for setting a new external force function f(x) in such a way that the set value of the factor γ approaches the target value γ_t if the deviation δ is determined to be equal to or greater than the reference value ε by the determination means.

14. (Currently Amended) An external force control program for providing a computer with functions for controlling an external force applied to an animal through an orthosis attached to the animal that makes a movement along with the activities

of muscle fibers, the program providing the computer with:

a myoelectric potential measurement function of measuring a myoelectric potential x that occurs in the body of the animal;

an external force setting function of setting a value of an external force f applied to the animal through the orthosis according to an external force ~~function f(x) with~~ function f(x) with the myoelectric potential x as a variable on the basis of the measured value of the myoelectric potential x;

a motion variable measurement function of measuring a motion variable y varying with the motion of the animal under the condition of the external force applied through the orthosis;

a factor setting function of setting a value of a factor γ according to a factor function $\gamma(f, y)$ with the external force f and the motion variable y as variables on the basis of the set value of the external force f and the measured value of the motion variable y;

a determination function of determining whether a deviation δ between the set value of the factor γ and target value γ_t thereof is less than a reference value ε; and

an external force function setting function of setting a new external force function f(x) in such a way that the set value of the factor γ approaches the target value γ_t if the deviation δ is determined to be equal to or greater than the reference value ε by the determination function.